

New Project Initiation Form

(To be completed by proponent of new project/document)

Additional pages may be attached if necessary.

a	<p>Explain the Scope of the new project/document:</p> <p>To identify and label the ‘chemical additives’ in all wearable material of structural and wildland firefighting to meet NFPA 1971 water, flame and thermal, resistance.</p> <p>To identify and label chemical contents in amounts so that the end user is aware of the chemicals worn during the duties of his/her job as a firefighter.</p> <p>To identify and label all chemical additives and their content amounts used in ‘station wear’ to meet NFPA 1975 standards for FR, WR, OR, IR, (flame, water, odor, and insect resistance).</p> <p>To adopt the European Chemical Agency (ECHA) standards of not more than 25 ppb PFOA and 1 ppm precursor in PPE worn by the fire service.</p> <p>To mandate disclosure to NFPA and IAFF by manufacturer if any chemical(s) used in the manufacturing or as end result of production have been labeled a ‘Contaminate of Emerging Concern’ aka CEC by the EPA., or as ‘Substance of Very High Concern’ aka SVHC by European Chemical Agency (ECHA).</p>
b	<p>Provide an explanation and any evidence of the need for the new project/document:</p> <p>PFAS chemicals are used as water repellents in our PPE. Some of the PFAS chemicals such as PFOA/PFOS are known reproductive toxins. Some PFAS chemicals will ‘form’ PFOA. Some in as little as one year.</p> <p>Chemical additives and their amounts are considered ‘proprietary information’ my manufacturers.</p> <p>Chemical additives are used in the manufacturing of PPE and station wear. While we may know the family, such as PFAS, we do know the specific chemicals of this family, or the contents in ppb, ppm, or volume.</p> <p>We have been told by manufacturers, that the amounts used in previous years were ‘trace’ amounts.</p> <p>‘Trace amounts’ is subjective language. What may be trace amounts to a manufacturer may well exceed the recommended amounts in the science community.</p> <p>In January 2018, we received the PFAS testing results of samples taken from ‘new, never-worn, 2004 structural turnout gear samples. The results could only qualify a ‘fraction’ of the actual chemicals within the fabric, yet this fraction was still 5 times the ECHA (European Chemical Agency) 2015 standard for PFOA within PPE.</p> <p>We have been told by manufacturers varying comments; “no PFOA was ever used”, “PFOA was found in ‘trace amounts’”, “PFOA is no longer used”, etc. We have NO idea what is or is not used. There are no rules, or regulations existing in America that dictate maximum amounts.</p> <p>The testing was performed at a lab chosen by Professor of Physics at Notre Dame, Graham Peaslee.</p> <p>https://scontent-iad3-1.xx.fbcdn.net/v/t1.0-9/27868040_1998877260436347_3313200296680537000_n.png?oh=560da75ef1ab12e9b80446d95a09a1dc&oe=5B0C9BA2</p>

2004 PFAS TESTING RESULTS..

These are the PFAS compounds found in the same gear samples that Professor Peaslee of Notre Dame, IN gave us in August 2017. Those samples were to confirm or deny there was 'fluorine' in the PPE. If there were no fluorine, there would be no PFOA.

Please read careful Professor Peaslee's explanation on the testing and the amounts revealed.

January 29, 2018, Professor Graham Peaslee:

Hi Diane,

I have some LC-MS/MS results from an academic lab that I trust...they took the four pieces of clothing you sent me and took a small piece of each and rinsed it three times in heated methanol, and analyzed the rinse for the presence of 78 different PFAS. We know from previous textile work that this only will get some small fraction of what is adhered to the fabrics, but it will identify what is there. The results look something like this:

Item	Concentration (ng/g)							
	PFBA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFTeDA	PFUEA
Right Sleeve	<LOQ	14	<LOQ	<LOD	121	66	<LOD	<LOD
Left Under Arm	<LOQ	<LOD	13	116	74	57	<LOD	<LOD
Moisture barrier	<LOQ	<LOD	<LOD	41	<LOD	25	<LOD	<LOD
Tail	<LOQ	<LOD	14	<LOD	84	28	30	<LOD
Envelope	46	109	<LOD	<LOD	<LOD	<LOD	<LOD	40

A quick explanation...these are the 7 different PFAS that showed up above level of detection (LOD), or above level of quantification (LOQ). The PFBA are C4 acids, the PFHxA are C6 acids, the PFHpA are C7 acids, the PFOA are C8 acids, the PFNA are C9 acids, and the PFDA are C10 acids, and the last one is a C11 acid.

The first four rows are your four fabric samples with concentrations in ppb, and the last sample is the brown envelope in which the samples were shipped, so it is possible it contained some short-chained PFAS that might have contaminated the right sleeve sample. If you want to send these to a commercial lab at some point, you will want to put them in individual ziploc bags.

In summary, there are C8, C9 and C10 PFAS found on each garment, but less on the moisture barrier. These are "long-chain" PFAS, and the majority seems to be heavier than PFOA, although there is certainly PFOA present. Combined with the PIGE results which showed high levels of F present, and a methanol rinse that only removes a small fraction for analysis I would guess there is plenty of these long-chain PFAS applied to these garment samples.

The lab also did a GC/MS test for volatile PFAS, and found only volatile PFAS on the Tail sample, but with fairly high concentrations: 6:2 FTOH (120 ng/g), 8:2 FTOH (3600 ng/g), and 10:2 FTOH (1300 ng/g) (with all other analytes below detection.)

The fact that both the GC and LC/MS data are indicating C8 and C10 in the samples helps confirm the long-chain observation. To my knowledge, this type of long-chain PFAS chemistry is not typically used in textiles these days...so it is unusual to see them in samples.

I trust these data, and you are can share these results with your colleagues - but if you want to go further with the data in a court of law or elsewhere, you would have to have a commercial lab confirm these results...and that is

<https://mail.oxl.com/webmail-st02m-us/PrivateMessage>

1/2

2/15/2018

Fwd:

pricey I know, but now you know what to look for at least. Armed with this information I bet you can start asking who used these long-chain PFAS commercially in fire-resistant clothing.

I wish you luck in your investigation. Sorry this took so long, but all the labs are very busy these days.

GRAHAM

Much work has been done in the area of firefighting Personal Protection Ensembles and the PFAS chemicals used as coatings by the European Chemical Agency as shown below:

ECHA

In 2006 the European Chemical Agency (ECHA), began the process of notifying textile manufacturers that they would be limiting/prohibiting the chemical PFOA and related PFAS chemicals. See the 385 page ECHA BACKGROUND DOCUMENT ON PFOA : <https://echa.europa.eu/documents/10162/61e81035-e0c5-44f5-94c5-2f53554255a8>

EUROPEAN CHEMICAL AGENCY DOCUMENTS ON PFOA:

<https://echa.europa.eu/documents/10162/61e81035-e0c5-44f5-94c5-2f53554255a8>

page 35, Surface Treated Textiles B.2.2.5

B.2.2.5 Use of PFOA-related substances in textiles and leather Side-chain fluorinated polymers are widely used in the surface treatment of textiles and leather to provide water, grease, dirt, and oil repellent properties as well as to achieve chemical resistance. These repellents are mainly copolymers of fluoroalkyl acrylates and methacrylate (Lacasse and Baumann, 2004). They are used in numerous textile and leather articles such as sports and outdoor clothing, home textiles and upholstery, carpets, automotive and aviation industry, sun protection / building industry and lifting and carrying belts as well as in the professional sector, e.g. medical garments. Apart from finished articles, PFOA-related substances are also used in impregnating agents for consumer use.

According to industry, the treatment of textiles constitutes the most important use of PFOA-related substances in terms of volume accounting for about 50 % of total market demand. This is plausible as PFOA-related substances (and PFOA presumably as impurity) are widely found in a large variety of textile and leather articles. However, there is no comprehensive and reliable data available to give a complete picture on the volumes of PFOA-related substances used in textiles and leather in the EU. The estimates in the following paragraphs were derived from industry and registration data (see Appendix B.2.2.5 and confidential Appendix for details).

PFOA-related substances for textile and leather treatment are produced within the EU as well as imported into the EU. PFOA-related substances in the EU are mainly used in non-apparel applications, e.g. the manufacturing of technical textiles, furniture, home textiles or automotive industry (Stakeholder Consultation, 2013/14). There is little information available on the volumes of PFOA-related substances used in the EU. Based on registration data as well as on information gained in the consultation with industry it is estimated for further calculations that EU market demand of PFOA-related substances for textile and leather treatment is about 1,000 t/a.

PFOA-related substances are also imported into the EU in finished textile articles, especially in garments, which are predominately manufactured outside the EU (mainly Asia) for the European market (Danish Environmental Protection Agency, 2013; Stakeholder Consultation, 2013/14). There is very little information on the total volumes of PFOA-related substances in imported textile and leather articles. Based on industry information it is estimated that imported textile articles contain 1,000-10,000 t/a of PFOA-related substances to be used for further calculations.

PAGE 41 B.4.1.2 Degradation of PFOA-related substances

PFOA-related substances degrade to PFOA under environmentally relevant conditions, and are therefore included in this proposal. The following text describes how this occurs. **According to REACH, if transformation/degradation products with PBT properties are being generated, the substances themselves must be regarded as PBT substances ("The identification shall also take account of the PBT/vPvB-properties of relevant constituents of a substance and relevant transformation and/or degradation products." REACH Annex XIII).** Therefore, PFOA-related substances are PBT-substances as well. The number of PFOA-related substances on the market seems to be high. Some examples are given in Appendix B.1. Available degradation studies are described in chapter B.4.1.2 and are summarised in Table A.B.4-1 in Appendix B.4.1.

PFOA-related substances all show a similar structural feature. The non-degradable perfluorinated carbon chain (C8F17-X) attached to a degradable non-fluorinated moiety. Thus, the substances are structurally similar. Using the weight of evidence approach it seems very likely that also similar substances may degrade in a similar way in the environment. At the end of a number of degradation steps PFOA may most probably be the end product and persist in the environment.

B.4.1.2.1 8:2 FTOH

8:2 FTOH metabolism universally show the formation of perfluorooctanoate (PFOA) and, to a smaller fraction, perfluorononanoate (PFNA) and lower-chain-length PFCAs etc etc etc.....

In conclusion, 8:2 FTOH mainly degrades to PFOA in sludge, soil, water and air. In vertebrates, PFOA is the main perfluoric acid formed by biotransformation of 8:2 FTOH. Emission and exposure of 8:2 FTOH will add to the overall blood concentration of PFOA in human blood stream

PAGE 51 B.4.1.2.5 Conclusion on degradation of PFOA-related substances

In conclusion, all the presented PFOA-related substances are degraded to PFOA and shorter chain PFCAs by abiotic and biotic processes in the environment. For those substances where no degradation studies are available it can be assumed that based on the chemical similarity the substances will most probably be degraded in a similar way. Thus, based on the weight of evidence approach PFOA will most probably be released in the environment. Hence, these substances need to be considered as important sources of PFOA in the environment. Furthermore, they need, according to REACH, be considered as PBT-substances as well.

<https://echa.europa.eu/documents/10162/61e81035-e0c5-44f5-94c5-2f53554255a8>

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B.4.4.3.2 Environmental release from surface-treated textiles

Side-chain fluorinated polymers are used for example as stain and soil repellents for textiles (for further information on use see chapter B.2.2.5). Treatment of textiles In B.2.2.5 it has been estimated that up to 1000 t/a PFOA-related substances are used for textile treatment within the EU. PFOA and PFOA-related substances present in fluorotelomer-based products are likely released to air (Buck et al. cited in Prevedouros et al., 2006) and wastewater during industrial application of fluorotelomer-based products to textiles. According to ECHA Guidance R. 16 ERC 5 (industrial inclusion into or onto a matrix) can be assigned for the treatment of textiles (50% released to air, 50% to water, and 1% released to soil). Since PFOA-related substances are likely released to air, a worst case overall emission factor of 50% has been used for the following calculation. Moreover, it was estimated that 2% of PFOA-related substances are not bound to the side-chain fluorinated polymers which would result in $(50\% \times 2\% \times 1000 \text{ t/a}) = 10 \text{ t}$ PFOA-related substances annually released to the environment. The 2 % were derived from Russel et al. (2008), see above Regarding emissions to wastewater, it can be seen from measured data that PFOA is emitted from textile industry into water: Clara et al. (2008) have tested two effluents from textile industry. PFOA has been measured in the range of 1.4 - 76 ng/L. However, no measured data are available on PFOA-related substances. Although no data is available on the degree of fixation during the finishing process, a worstcase emission calculation could comprise the same estimates as for the releases to air (see above) and thus result in the release of 10 t/a PFOA-related substances. However, since it is shown in the following described studies that large amounts of PFOA-related substances are released in subsequent life-cycle steps it is assumed that 50% of the unbound fraction will be released during industrial use and the remaining 50% during use and disposal of textiles. Use of textiles Beside the amount of PFOA-related substances used for textile treatment in the EU (10 t/a remaining in textile after finishing), it has been estimated that 1,000 - 10,000 t/a of these substances are imported annually into the EU in outdoor jackets (see chapter B.2.2.5). It is assumed that amounts of PFOA-related substances have been already emitted during the manufacturing of textiles outside the EU. Here it is estimated as well that 50% of the PFOA-related substances not bound to the polymer matrix remain in the textiles and will be released during service-life, resulting in additional emissions of 20 - 200 t/a from imported textiles. Taking the respective ERC into account (ERC 10b: Wide dispersive outdoor use of long-life articles, high or intended release: 100% to air, 100% to water, 100% to soil), a worst-case emission would be 100% to all environmental compartments. In contrast to outdoor use, the ANNEX XV PROPOSAL FOR A RESTRICTION – Perfluorooctanoic acid (PFOA), PFOA salts and PFOA-related substances 82 ERC for indoor use would result in much lower release factors (ERC 11a: Wide dispersive indoor use of long-life articles with low release: 0.05% to air, 0.05% to water) which cannot fully be related to real use patterns of e.g. outdoorjackets and thus is less valid than the worst-case assumption of outdoor use. During the use of textiles the polymer or textile fibres can be abraded from the textile surface during laundering and are subsequently discharged into wastewater (Russell et al., 2008). However, the type of textile has a great influence on the emission pattern, since the frequency of washing can vary significantly; e. g. clothes are probably washed more often than upholstery or interior textiles in cars (Brooke et al., 2004 cited in Federal Office for the Environment (FOEN), 2009). **As treated textiles such as outdoor jackets are worn outside and emissions from textiles in vehicles will be released to outdoor air, it can be considered that all residuals will be emitted to the atmosphere during service life as a reasonable worst case (Federal**

Office for the Environment (FOEN), 2009). Experiments reveal that considerable amounts of PFOA and FTOHs will be released during service life. It has been shown that the investigated outdoor materials contained PFASs in relatively high concentrations (Kotthoff et al. 2015; Schlummer et al. 2013). 8:2 FTOH was the dominating congener of the analyzed FTOH regarding contents and 8:2 FTOH emissions from 8 products ranged from 16.9-494 ng/m³ (see Table A.B.4-7 in the Appendix). 1.5 - 4% of the initial amounts of the analytes which were originally present in the test desiccator were emitted during 3 hours using a high air exchange rate of 116 per hour. Based on that, total FTOH emissions into the environment were calculated to be 8 - 200 ng/h. Knepper et al. (2014) determined PFASs between 0.03 - 719 µg/m² in all Durable Water Repellent (DWR) jackets tested (purchased in 2012). PFOA was contained in all DWR jackets, although at lower concentrations (0.02 - 171 µg/m²) compared to FTOHs. Within the same project, evaporation and washing was simulated to assess releases from the jackets, including freshly impregnated textiles. 8:2-FTOH was found in all air samples in concentrations from 3.46 - 90.6 µg/m² after 5 days. Two separate washing experiments were conducted using four different jacket pieces at once each time in order to trace additional releases of PFASs into washing water. Washing experiments revealed highest releases of > 200% for PFOA although internal standards had been applied, when summing up releases from the first and second wash cycle. However, it cannot be concluded on whether PFOA originates from residues in fluoropolymer manufacture or from the degradation of PFOA-related substances. Moreover, the release of volatile PFASs from the wearing of outdoor jackets was simulated based on the ratio between concentrations measured by solvent extraction of jackets and concentrations measured in the air (µg/m²). It has been shown that 6.51-17.6% 8:2 FTOH were emitted. It was shown that DWR jackets contribute as one particular source among many others to the overall emission of PFOA and PFOA-related substances (Knepper et al., 2014). Also FOEN (2009) estimated that PFOA-related substances are emitted in considerable amounts from textile protection and impregnation agents. They calculated 8:2 FTOH emissions to the atmosphere for Switzerland in 2007 from textile protection and impregnation agents to be 0.3 - 0.9 t/a, respectively. Environmental release of PFOA from washing of textiles has also been shown for professional applications. Clara et al. (Clara et al., 2008) tested two laundry and cleaning sites where PFOA was found in concentrations of 6.5 - 59 ng/L.

(Imagine if we knew the actual chemical content of our impregnated PPE from 1999 – 2013?)

End-of-life When not emitted during service-life, it is assumed that emissions might also arise from the end-of-life phase of textiles. Textiles are disposed off together with municipal solid waste from households, which might be collected and reused. It is however expected that EU-wide incineration and landfilling are the most common disposal routes. Although incineration might destroy PFOA, a final conclusion cannot be made since insufficient information is available on the behaviour of PFOA and PFOA-related substances during the incineration process (see chapter B.4.4.4). In case, textiles containing PFOA or PFOA-related substances end up on landfills, especially in those EU countries with no incineration capacities, large uncertainties exist regarding the degradation of side-chain fluorinated polymers (see chapter B.4.1.2.4). Therefore, emissions might be higher, although potentially with lag in time.

Conclusion *The treatment of textiles is considered a major use of PFOA-related substances, leading to environmental releases. Moreover, as it can be seen from different experiments and measured product contents surface-treated articles represent a relevant source of PFOA and PFOA-related substances in the environment during their use phase. Moreover, emissions during their end-of life phase cannot be excluded.*

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The exposure scenarios identified in humans are as follows • Long term/life-long oral intake of PFOA from water, diet or dust (general population) • Manufacturing products containing PFOA (workers) Based on the identified health effects related to PFOA exposure, and the expected exposure scenarios relevant for the general population or the workers, the following DNELs need to be derived: • General population-DNEL • Workers-DNEL First, an overview of selected toxicological studies in animals with respect to type of study, endpoints and the associated LOAEL or NOAELs are given in Table B.5-1. The studies selected for DNEL derivation was scored according to Klimisch and all studies were rated to a score of 2.

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B.5.3.2 Occupational exposure

B.5.3.2.1 Fluoropolymer production workers As described in chapter B.2.3, a major industrial use of PFOA and the ammonium salt APFO, has been as a processing aid in the manufacturing process of several fluoropolymers. Under some workplace conditions its acid form, PFOA, may also be present. Sublimation from surfaces and volatilization from aqueous solutions can be pathways for worker exposure to PFOA (Kaiser et al., 2010). Even when operations are not running, residual material on surfaces in the work area may result in measurable airborne concentrations.

Intake using the external dose approach In a study by Kaiser et al. (Kaiser et al., 2010) both measured and modelled results suggest that sublimation from dry surfaces may lead to higher airborne concentrations than volatilization from aqueous

solution (Kaiser et al., 2010). Measured average air concentrations of PFOA near the process sumps were in the range 0.004 to 0.065 mg/m³ depending on the water content and pH in the sumps. Using an inhalation rate of 10 m³ /8 hour (Guidance on information requirements and chemical safety assessment Chapter R.8: Characterisation of dose [concentration]-response for human health), the intake from inhalation of occupational air is 0.040 to 0.65 mg/day or 571 to 9286 ng PFOA/kg bw/day when assuming a body weight of 70 kg.

Intake using the internal dose approach Very high serum concentrations of PFOA have been reported in fluoropolymer production workers (see Table B.5-10). Using these data, median concentrations based on the mean and max concentrations reported in the single studies were calculated to be 1750 ng/mL and 11,850 ng/mL, respectively. Using a one-compartment steady-state pharmacokinetic model as described in chapter B.5.3.1, the intakes back-calculated from the serum concentrations were in the range 0.8 to 13189 ng/kg bw/day with an overall mean intake of 298 ng PFOA/kg bw/day Table B.5- 10: Serum concentrations of PFOA (ng/mL) in occupationally exposed workers (Fromme et al., 2009) and intakes (ng/kg bw/day) back-calculated using a one-compartment steady-state pharmacokinetic mode

See tables page 118 – 119

B.5.3.2.2 Professional skiwaxers In winter sports such as cross-country skiing, downhill skiing and biathlon, ski waxes are applied to the skis to increase performance. Professional ski team waxes are exposed to aerosols and to some extent vapours when working in poorly ventilated small cabins during the skiing season from November until March, in particular when applying gliders. Waxes with different chemical characteristics fit different snow and temperature conditions, and can crudely be divided into gliders and grip waxes. The exact composition of gliders is rarely disclosed by the producers. However, modern gliders, available as solid blocks or as powders, consist mainly of petroleum-derived straight-chain aliphatic hydrocarbons with 20-80 carbon atoms and perfluoro-n-alkanes (PFAs), that is, alkanes with 12-24 carbon atoms where all hydrogen are substituted by fluorine (Ludwig, 1995, Gambaretto et al., 2003). In a recent study, concentrations of PFOA were determined in 11 different glider powders and 11 fluorinated solid blocks from six different manufacturers (Freberg et al., 2010). Perfluorinated carboxylic acids were detected in all samples. The median concentration of PFOA was 0.68 µg/g product in the solid block gliders and 2.7 µg/g product in the powders. Semifluorinated nalkanes (SFAs) have also been found in high concentrations in skiwax (Plassmann and Berger, 2010), and these chemicals are hypothesised to degrade to FTOHs and PFCAs in the environment (Plassmann, 2011).

Intake using the external dose approach In a study by Freberg et al., 2010, PFOA concentrations were determined in six air samples collected in ski waxing cabins during performance of work tasks resulting in occupational exposures. The instrument used to collect the samples was designed to simultaneously collect the three health related aerosol fractions; the coarser inhalable fraction, the thoracic fraction and the respirable fraction. All perfluoroalkyl carboxylates (PFCAs) with chain lengths from C4 to C14 were found in the samples, and the concentrations were similar in all three fractions. The median (range) concentrations of PFOA were 11 (8-38), 12 (10-44) and 14 (11-52) ng/m³ in the respirable, thoracic and inhalable fractions.

Intermediate scenario, professional skiwaxers According to “Guidance on information requirements and chemical safety assessment Chapter R.8: Characterisation of dose [concentration]-response for human health” an inhalation rate of 10 m³ /8 hours is to be used for workers. Concentration of PFOA in the respiratory air fraction (the fraction that may penetrate to the alveoli of the lung): 11 ng/m³ (median value) This gives an intake from inhalation of occupational air is 110 ng/day or 1.57 ng/kg bw/day when assuming a body weight of 70 kg.

High exposure scenario, professional skiwaxers According to “Guidance on information requirements and chemical safety assessment Chapter R.8: Characterization of dose [concentration]-response for human health” an inhalation rate of 10 m³ /8 hours is to be used for workers. Concentration of PFOA in the respiratory air fraction (the fraction that may penetrate to the alveoli of the lung): 38 ng/m³ (max value) This gives an intake from inhalation of occupational air of 380 ng/day or 5.4 ng/kg bw/day when assuming a body weight of 70 kg.

Intake using the internal dose approach Two Nordic studies have reported elevated concentrations of PFOA in serum from professional skiwaxers with a median concentration of 112 ng/mL whole blood (range 4.8 – 535 ng/mL) in the Swedish study (Nilsson et al., 2010) and 50 ng/mL serum (range 20-174 ng/mL) in the Norwegian study (Freberg et al., 2010). Since the PFOA concentration measured in whole blood is half of the serum concentration, the published figures in the Swedish study need to be multiplied with two in order to compare with the Norwegian study, giving a median serum concentration of 224 ng/mL (range 9.6 – 1070 ng/mL). The average serum concentration in the two ski waxing studies is 137 ng/mL serum ((50+224)/2). The average of the maximum concentrations of the two Nordic studies (Nilsson et al., 2010; Freberg et al., 2010) is calculated to be 622 ng/mL ((1070+174)/2), and is considered as a realistic worst case scenario.

Using the PK model as described above, the intakes back-calculated from the serum concentrations (whole blood concentrations multiplied by a factor of two) were in the range 0.46 to 124 ng/kg bw/day with mean intakes of 26 ng/kg bw/day and 5.8 ng/kg bw/day for the Swedish and the Norwegian study, respectively, giving an average of 16 ng/kg bw/day. These back-calculated intakes are in a similar range as those calculated using the external dose approach, indicating that the intakes are reasonable.

B.5.3.2.3 Semiconductor workers We describe the use of PFOA in the semiconductor industry in chapter B.4.4.2.3. Inside the semiconductor wafer manufacturing clean room, automated chemical delivery systems are installed to create a barrier between workers and the process and protect against chemical and physical hazards in the work environment (comment in public consultation from European Semiconductor Industry Association). Van der Putte et al. (van der Putte et al., 2010) also describes that there is no potential for exposure to the work place employee in the semiconductor industry.

B.5.3.3 Consumer exposure Consumer exposure includes exposure from house dust, indoor air as well as dermal or oral contact with consumer products. PFOA might be leaching from consumer products into house dust as well as both indoor and outdoor air, and thus ingestion of house dust and inhalation of air in both gas and particulate phase are potential exposure sources for PFOA. Exposure to PFOA can also occur through direct contact with consumer products such as all-weather clothing and textiles.

(I believe we are have much higher exposure than a 'consumer' but wished to highlight this exposure issue d.c.)

When considering risk for the general population, it is the total exposure (exposure from all sources) that is important to compare with the calculated DNELs. For that reason only the total exposure, as opposed to breaking down the exposure in different pathways, has been presented here. For further explanations see chapter B.5.3.5.

In background exposed populations, exposure to PFOA from air occurs primarily through inhalation of neutral polyfluorinated alkyl substances (PFAS) such as FTOHs (Stock et al., 2010). Concentrations of FTOHs in indoor air usually exceed the concentrations in outdoor air considerably (Harrad et al., 2010). Due to the low concentrations in outdoor air, exposure through inhalation of air is mainly through indoor air.

Ingestion of house dust is an exposure source for PFOA. As for indoor air, the concentrations in house dust are quite variable. The distribution pattern is often following a lognormal distribution, with some samples having concentrations far exceeding the mean and median values of the dataset (Harrad et al., 2010).

Dermal exposure to PFOA can occur through direct contact with consumer products. Use of PFOA-related substances in surface-treated textiles and leather is described in chapter B.2.2.5. Three surveys have been conducted in Norway to explore ranges of PFASs in clothing (SFT 2006; Grønn hverdag 2010; Schulze and Norin 2006) and both ionic and neutral PFASs were detected and PFOA were among the ionic PFASs detected. PFOA has also been found in carpets and textiles (Washburn et al., 2005), waxes and paints (Washburn et al., 2005), food contact

materials (Begley et al., 2005) and non-stick cookware (Sinclair et al., 2007). The dermal absorption of ionic PFASs has been thought to be low (e.g. the dermal absorption of ammonium perfluorooctanoate was only 0.048% (Fasano et al., 2005), thus this pathway has been thought to give only a minor contribution to the intake of PFASs. In a paper by Trudel et al., 2008, the authors were modelling the importance of different exposure pathways to PFOA. They found that the contribution to the total uptake dose was less than 1% in any of the scenarios for dermal exposure from wearing of treated clothes, from deposition of spray droplets on skin while impregnating, from skin contact with treated carpet and with upholstery, and from deposition of dust on skin. However, a more recent study indicates that the potential for dermal absorption is significant in both mouse and human skin and emphasizes that the extent of dermal absorption of PFOA is dependent on its ionization state. These results raise concern regarding the possibility for dermal exposure in both occupationally exposed individuals and the general population (Franko et al., 2012).

B.5.3.4 Indirect exposure of humans via the environment

Indirect exposure of humans via the environment includes exposure from food and beverages, drinking water and inhalation of outdoor air. In general, food might be polluted with PFASs present in the environment. Meat etc. can also be contaminated through animal feed. Further, it has been demonstrated that PFASs can migrate from food packaging and non-stick cookware which thus represents additional sources of exposure from food (Begley et al., 2005; Sinclair et al., 2007). Both ionic and neutral PFASs have been determined in samples of food as summarised by Egeghy and Lorber (2011), Fromme et al. (2009) and Vestergren and Cousins (2009). Ionic PFASs have in general been found in highest concentrations in samples of fish and shellfish (Ericson et al., 2008a; Tittlemier et al., 2007), while the highest amounts of perfluoroalkyl sulfonamides (FOSAs) have been observed in composite samples of fast food (Tittlemier et al., 2006). In a recent study within the EU project PERFOOD, in total 50 composite samples from 15 food groups collected in four different countries (Belgium, Czech Republic, Italy and Norway) were analysed. PFOA was found above the method quantification limit in 24% of the samples. The concentrations were between 4.99 and 49.5 ng/kg sample with a median concentration of 9.14 ng/kg (Hlouskova et al., 2013).

Dietary intakes of PFOA are often estimated by multiplying the consumption (g/day) obtained from questionnaires with the PFOA concentrations in the respective food (e.g. Ericson et al., 2008a, Haug et al., 2010a). But PFOA intakes have also been estimated using concentrations determined in duplicate diet samples (e.g. Fromme et al., 2007, Kärman et al., 2009). In a recent study within the EU project PERFOOD, the dietary exposure to selected PFAAs (perfluorinated alkyl acids; carboxylates, sulfonates and phosphonates) was estimated in four selected European countries (Belgium, the Czech Republic, Italy and Norway) representing Western, Southern, Eastern and Northern Europe (Klenow et al., 2013). Foods of

plant origin (e.g. fruit and vegetables) were the most important for the dietary exposure to PFOA. Mean dietary exposure estimates for PFOA (using an upper bound approach where all values below the LOQ were considered to be equal to LOQ) were calculated between 0.107 and 0.231 ng/kg bw/day for adults. For children (3-9 years of age), the mean dietary exposure estimates were calculated between 0.195 and 0.389 ng/kg bw/day. The European Food Safety Authority (EFSA) has recently published a scientific report on dietary exposure estimates of PFASs for Europeans. For adults, the highest upperbound mean estimate of dietary exposure to PFOA, taking 13 different European countries into account, was 4.3 ng/kg bw/day, while the highest 95% percentile estimate was 7.7 ng/kg bw/day (EFSA, 2012).

Few data are available on time trends of PFOA concentrations in food. However, in a recent Swedish study where PFOA was determined in archived food market basket samples, increasing concentrations were observed in the period 1995 to 2010. In that study, intakes of 0.348, 0.495 and 0.692 ng/kg bw/day were found in the samples from 1999, 2005 and 2010, respectively (Vestergren et al., 2012).

B.5.3.5 Combined human exposure assessment

The combined human exposure assessment considers exposure from all sources (both sources of consumer exposure and indirect exposure of humans via the environment as described in chapter B.5.3.3 and B.5.3.4. Based on available exposure data from the literature, total intakes have been estimated for PFOA in general populations (Egeghy and Lorber 2011; Fromme et al., 2009; Trudel et al., 2008; Vestergren and Cousins, 2009; Cornelis et al., 2012). In these studies, intakes have been estimated based on various scenarios by changing the concentrations in the exposure media (e.g. high or low concentration in drinking water) and the exposure factors (e.g. high or low dust ingestion rate). In addition, a Norwegian study by Haug et al. (2011) considers multiple exposure sources on an individual basis (Haug et al 2011). Total intakes from the mentioned studies are presented in table B.5-11. The various studies listed had different approaches for estimating the total exposure. For instance, Trudel et al (2008), estimated intakes based on low, intermediate and high scenarios, while Vestergren and Cousins (2009) estimated intakes based on scenarios which they call background exposure, high drinking water exposure, point source drinking water exposure and occupational exposure. Cornelis et al (2012), estimated average and P95 intake for PFOA from air, dust, soil and diet. However, as complementary studies, the studies in table B.5-11 give a good picture of the variability in exposure that can be expected both in an intermediate/median exposure scenario as well as in a high exposure scenario.

Estimates given high drinking water exposure and point source drinking water exposure are considered relevant to include for the high exposure scenario. The rationale behind this is that releases in drinking water might affect large general populations and this is not unlikely to happen, especially since not all sources and uses of PFOA are known. Thus, accidental exposures giving higher serum/plasma concentrations are not neglected in the risk evaluation of a worst case scenario.

See tables pages 123- 124

A breast fed infant will be exposed to considerable amounts of PFOA during the first months of life. A median daily intake of 4.3 ng PFOA/kg bw/day was estimated for breast-fed infants in a recent Norwegian study, and consumption of breast milk was found to be the major source of exposure for these infants (Haug et al., 2011). The total exposure to PFOA for infants was around 15 times higher than the corresponding estimates for adults. The considerable exposure of infants through breast feeding is also supported by the decreasing concentrations of PFOA in breast milk during the course of lactation, seen in a depuration rate study (Thomsen et al., 2010). In a study from Germany, median PFOA levels in cord blood were reported to be 1.7 ng/mL and in blood of 6 month old infants the corresponding level was 6.9 ng/mL (Fromme et al., 2010). PFOA concentrations in infant serum at 6 months of age were 4.6 times higher than in maternal serum at delivery. Further, for all subjects, increasing PFOA concentrations were seen during the first 6 months of life, and most subjects showed a clear decrease in the following months. Based on the table above, the total exposure estimates for the general population are as follows:

Total exposure estimate, intermediate/median scenario

Adults: the intakes of PFOA are in the range 0.26 to 6.1 ng/kg bw/day Children \geq 2years and teens: the intakes of PFOA are in the range 2.6 to 20.1 ng/kg bw/day Children < 2 years: the intakes of PFOA are in the range 4.3 to 9.8 ng/kg bw/day

Total exposure estimate, high scenario (e.g. high drinking water concentration, high dust concentrations)

Adults: the intakes of PFOA are in the range 4.1 to 44 ng/kg bw/day Children \geq 2years and teens: the intakes of PFOA are in the range 53 to 72 ng/kg bw/day Children < 2 years: the intakes of PFOA are in the range 83 to 114 ng/kg bw/day

Adults Food is generally the major source of exposure for background exposed adults (Egeghy and Lorber 2011; Fromme et al., 2009; Trudel et al., 2008; Vestergren and Cousins 2009, Haug et al., 2011). However, on an individual basis, the indoor environment can account for up to around 50% of the total intake (Haug et al., 2011). Further, drinking water exposure is dominant for populations near sources of contaminated drinking water. The role of PFOA-related substances in the total exposure to PFOA is still not clear. Vestergren et al. 2008 found that in an intermediate scenario 2 - 8% of the PFOA exposure could be attributed to exposure from PFOA-related substances, while in a high exposure scenario the PFOA-related substance exposure could be as high as 28 - 55%.

B.5.3.5.2 Intake using the internal dose approach

The internal dose reflects an integrated exposure over time comprising various sources and pathways, and it also takes individual differences into consideration (e.g. age and gender). In Table B.5-12 examples of serum/plasma concentrations in the general European adult population are given, and in Table B.5-13, examples of serum/plasma concentrations of PFOA (ng/mL) in children world-wide are summarised. Further, in Table B.5-14 examples of serum concentrations of PFOA (ng/mL) in cord blood world-wide are reported. All together these data give a good overview of internal doses as well as the prenatal exposure of PFOA in the general population

In year 2000, a phase-out of production of “perfluorooctanyl” compounds was announced by the main US manufacturer, 3M (3M Company 2000). Subsequently, the US Environmental Protection Agency requested eight manufacturers to voluntarily eliminate their production and use of perfluorooctanoate (PFOA), its precursors and related chemicals (US EPA 2006). These measures were thought to lead to decreasing concentrations of among others PFOA in human blood. Several studies have explored time trends of PFOA concentrations in blood. In some studies a decrease from around year 2000 have been observed e.g. Germany (Schröter-Kermani et al 2013; Yeung et al 2013), Norway (Haug et al., 2009; Nøst et al., 2014), Australia (Toms et al., 2009), Sweden (Glynn et al., 2012; Sundström et al., 2011; Axmon et al., 2014), USA (Calafat et al 2007; Olsen et al., 2008; Olsen et al., 2012; Wang et al., 2011), Japan (Okada et al., 2013; Harada et al., 2011). In other studies the blood concentrations of PFOA have been quite stable the last decade e.g. Greenland (Long et al., 2012), Japan (Harada et al., 2007, Harada et al., 2010), USA (Kato et al., 2011), Korea (Harada et al., 2011).

In a study by D’eon and Mabury (2011) the relatively slow decrease of PFOA concentrations in blood compared to the expected decrease based on the measured intrinsic elimination half-life in humans, is suggested to be caused by continued PFOA exposure, either through direct or indirect exposure. A recent study by Gebbink et al. (2015) demonstrates a significant increase between 1997 and 2012 in the % linear isomer PFOA and FOSA in Swedish human serum. Thus, taking measures to reduce exposure to PFOA is as important today as it was some years ago.

Table B.5- 12: Examples of serum/plasma concentrations of PFOA (ng/mL) in the general European adult population and back-calculated intakes using a one-compartment steady-state pharmacokinetic model

See tables pages 126 - 127

Based on the back-calculated intakes above, the total exposure to PFOA for the general European adult population is between 0.01 to 12 ng/kg bw/day. This is within the range of the intake calculated using the external dose approach, indicating that the intakes are reasonable.

B.5.3.6 Summary and discussion of human health exposure assessment

Based on the external dose approach, the total exposure to PFOA for the general adult population in an intermediate/median scenario varied between 0.26 and 6.1 ng/kg bw/day and for children the external dose varied between 2.6 and 20.1 ng/kg bw/day. Similar intakes were also obtained when back-calculating intakes from the measured blood concentrations, with total exposure to PFOA for the general European adult population is between 0.01 to 12 ng/kg bw/day. This indicates that the intakes are reasonable. In a high exposure scenario the intakes for the general European adult population varies between 4.1 and 44 ng/ kg bw/day and for children the range is between 53 and 114 ng/ kg bw/day. This is in the same range as the exposure to professional ski waxers back-calculated from the serum concentrations (0.46 to 124 ng/kg bw/day) with a mean intake of 16 ng/kg bw/day. The back-calculated intakes from serum concentrations for occupationally exposed workers were in the range 0.8 to 13189 ng/kg bw/day with an overall mean intake of 298 ng/kg bw/day

The internal serum concentration reflects an integrated exposure over time comprising various sources and pathways, and it also takes individual differences into consideration (e.g. age and gender). The internal concentration is easy to obtain due several different cohorts available, compared to calculating the external exposure as PFOA comes from many different sources. Thus, the internal PFOA serum/plasma concentrations have been used in the risk characterisation. **Concentrations of PFOA in occupationally exposed workers have been reported to be in the range of 1750 to 11850 ng/mL (Table B.5-10), a mean serum concentration of 137 ng/mL was calculated based on two Scandinavian studies, but concentrations up to 1070 ng/mL was reported (chapter B.5.3.2.2).** Many studies in Europe as well as around the world have measured PFOA concentrations in human serum/plasma of general populations. Concentrations in populations exposed to high drinking water concentrations are considered relevant to include for the high exposure scenario as releases in drinking water might affect large general populations and this is not unlikely to happen, especially since not all sources and uses of PFOA are known. Serum concentrations of PFOA in the European adult population are found in the range from 0.1 to 100 ng/mL (Table B.5- 12). Using the data in Table B.5-12, mean concentrations based on the median and max concentrations reported in the single studies were calculated to be 3.5 ng/mL and 21 ng/mL, respectively. Serum levels of PFOA in children world-wide has been reported to be in the range 0.3 to 22 ng/mL (Table B.5-13), with the exception of children that have been drinking heavily contaminated drinking water. In this case the highest serum concentration was 1283 ng/mL. Mean concentrations based on the median and max concentrations reported in the single studies, excluding two studies where the children have been exposed to PFOA through consumption of drinking water (Mondal et al., 2012; Høltzer et al., 2008), were calculated to be 2.5 ng/mL and 9.7 ng/mL, respectively. Mean concentrations based on the median and max

concentrations reported in the single studies including the two studies where the children have been exposed to PFOA through consumption of drinking water (Mondal et al., 2012; Høltzer et al., 2008) were calculated to be 6.4 ng/mL and 108 ng/mL, respectively. PFOA concentrations in both cord blood have been measured in a few studies world-wide and the mean concentrations based on the median and max concentrations reported in the single studies (Table B.5-14) were calculated to be 1.3 ng/mL and 4.1 ng/mL, respectively.

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<https://echa.europa.eu/documents/10162/61e81035-e0c5-44f5-94c5-2f53554255a8>

Textiles for personal protection equipment in the professional sector derogated until 2020

During stakeholder consultation it was indicated by some companies that substitution of PFOA and PFOA-related substances is not yet possible for textile applications requiring high technical performance, e.g. combined high water- and oil-repellency and chemical resistance, because with alternatives these demands cannot be fulfilled. Such textiles are used for workers protection clothing, like work wears for oil drilling, fire fighting, military and surgery. Furthermore, for filter materials for oil and fuel filtration it was reported that no alternatives are available. At the same time other companies report the availability of alternatives (short chain fluorinated chemicals) in high performance areas, e.g. personal protection equipment and automobile industry. Overall, it cannot be fully assessed whether derogation is justified for the use of PFOA and PFOA-related substances in the professional sector due to data gaps mainly on volumes, specific uses and substances. It has to be kept in mind that every exemption contributes to continuous emissions to the environment, especially when RMMS are not applicable. The DS would agree to grant a longer transitional period for the remaining uses of PFOA and PFOA-related substances in the professional sector. Personal protection equipments needs to fulfill specific requirements, which are established in respective standards (e.g. standard EN 13034 for protective clothing against liquid chemicals – performance requirements for protective clothing offering limited protective performance against liquid chemicals; standard EN 469 for protective clothing for firefighters – performance requirements for protective clothing for firefighting). However, for textiles used outdoor, e.g. (awnings and outdoor furnishing, camping gear, covers for outdoor and marine equipment, exterior architectural textiles, and geotextile) alternatives are available. Moreover, those items may directly emit residual amounts of PFOA and PFOA-related substances into the environment a derogation for these uses is not proportionate. For personal protection equipment a derogation until 2020 would be feasible to allow further development of alternatives.

In 2015, the ECHA approved the derogation of FIREFIGHTER PPE to allow up to 25 ppb PFOA and 1 ppm precursors. This is up from the ECHA's original request of 2ppb PFOA.

The ECHA gave the manufacturers till 2020 to make these changes. The manufacturers do have the option to request more time.:

<https://echa.europa.eu/documents/10162/3d13de3a-de0d-49ae-bfbd-749aea884966>

page 26:

see also: • allow the manufacture in the EU, and the import, of C-6 mixtures used as alternative substances, which might otherwise be prohibited based on the unavoidable PFOA (and related substance) content reported by the only EU manufacturer (RAC notes that the limit for PFOA-related substances is only half the concentration of such substances in emulsions in which C-8 fluorochemicals are intentionally used). As some of the manufacturing steps require transport of the isolated intermediates this should be exempted under certain conditions¹⁸;

¹⁸ Uses for which derogations have been requested during the public consultation include manufacturing of C-6 substances, fluoropolymers made without the intentional use of PFOA or PFOA-related substances (and the articles made from them), outdoor and personal protection fabrics, food contact materials and articles, paper, firefighting foam, printing inks, nano-coatings, ski waxes, medical devices, spare parts, photographic applications and semiconductor manufacture. In general, these involve the use of substances that are unintentionally contaminated with PFOA/PFOA-related substances, and therefore reflect concerns about being able to meet the 2 ppb threshold, but in some cases it is based on claims that C-8 fluorochemicals are still necessary (i.e. the existing alternatives are not technically suitable).

In 2013, PFOA was classified a SVHC. There is no rule stating a manufacturer must notify NFPA or IAFF. As such, no manufacturer did not notify NFPA or IAFF. Manufacturers have no legal obligation to notify NFPA or IAFF if a substance they are using in FF equipment has been labeled a SVHC (Europe) or, a CEC (contaminate of emerging concern, USA). However, a moral obligation should not be excluded.

There was no mandatory 'recall' or removal of 'back-stock' in 2013 intended for use in PPE.

Therefore, going forward, at any time, when a substance used by any manufacturer for use in standards for NFPA 1971 and NFPA 1975, is deemed a SVHC, or a CEC, both NFPA and IAFF Health and Safety Director must be notified and process must be put in place to notify the fire service end user, the fire fighter.

See here the 2013 Support Document for the Identification of PFOA as a SVHC Substance of Very High Concern:

<https://echa.europa.eu/documents/10162/8059e342-1092-410f-bd85-80118a5526f5>

See related European fire service literature on this subject:

http://www.hemmingfire.com/news/fullstory.php/aid/2601/Six-year_PFOA_reprieve_for_firefighters_protective_clothing.html

See here for 2015 Firefighter PPE Symposium and open discussion of same with

Dr Roger Klein and manufacturers:

http://www.hemmingfire.com/news/fullstory.php/aid/2660/PPE_Duty_of_Care_Forum_-_condensed.html

The end user of a product that has precursors that will form PFOA must be aware. Anything less is unacceptable in this day and age. Such is the case with California's Proposition 65:

California Proposition 65:

Proposition 65 in Plain Language

Feb 1, 2013

What Is Proposition 65?

In 1986, California voters approved an initiative to address their growing concerns about exposure to toxic chemicals. That initiative became the Safe Drinking Water and Toxic Enforcement Act of 1986, better known by its original name of Proposition 65. Proposition 65 requires the State to publish a [list of chemicals](#) known to cause cancer or birth defects or other reproductive harm. This list, which must be updated at least once a year, has grown to include approximately 800 chemicals since it was first published in 1987.

Proposition 65 requires businesses to notify Californians about significant amounts of chemicals in the products they purchase, in their homes or workplaces, or that are released into the environment. By providing this information, Proposition 65 enables Californians to make informed decisions about protecting themselves from exposure to these chemicals. Proposition 65 also prohibits California businesses from knowingly discharging significant amounts of listed chemicals into sources of drinking water.

The Office of Environmental Health Hazard Assessment (OEHHA) administers the Proposition 65 program. OEHHA, which is part of the California Environmental Protection Agency (Cal/EPA), also evaluates all currently available scientific information on substances considered for placement on the Proposition 65 list.

What types of chemicals are on the Proposition 65 list?

The list contains a wide range of naturally occurring and synthetic chemicals that are known to cause cancer or birth defects or other reproductive harm. These chemicals include additives or ingredients in pesticides, common household products, food, drugs, dyes, or solvents. Listed chemicals may also be used in manufacturing and construction, or they may be byproducts of chemical processes, such as motor vehicle exhaust.

How is a chemical added to the list?

There are four ways for a chemical to be added to the Proposition 65 list. A chemical can be listed if either of two independent committees of scientists and health professionals finds that the chemical has been clearly shown to cause cancer or birth defects or other reproductive harm. These two committees—the Carcinogen Identification Committee (CIC) and the Developmental and Reproductive Toxicant (DART) Identification Committee—are part of OEHHA's Science Advisory Board. The committee members are appointed by the Governor and are designated as the "State's Qualified Experts" for evaluating chemicals under Proposition 65. When determining whether a chemical should be placed on the list, the committees base their decisions on the most current scientific information available. OEHHA staff scientists compile all relevant scientific evidence on various chemicals for the committees to review. The committees also consider comments from the public before making their decisions.

A second way for a chemical to be listed is if an organization designated as an "authoritative body" by the CIC or DART Identification Committee has identified it as causing cancer or birth defects or other reproductive harm. The following organizations have been designated as authoritative bodies: the U.S. Environmental Protection Agency, U.S. Food and Drug Administration (U.S. FDA), National Institute for Occupational Safety and Health, National Toxicology Program, and International Agency for Research on Cancer.

A third way for a chemical to be listed is if an agency of the state or federal government requires that it be labeled or identified as causing cancer or birth defects or other reproductive harm. Most chemicals listed in this manner are prescription drugs that are required by the U.S. FDA to contain warnings relating to cancer or birth defects or other reproductive harm.

A fourth way requires the listing of chemicals meeting certain scientific criteria and identified in the California Labor Code as causing cancer or birth defects or other reproductive harm. This method established the initial chemical list following voter approval of Proposition 65 in 1986 and continues to be used as a basis for listing as appropriate.

What requirements does Proposition 65 place on companies doing business in California?

Businesses are required to provide a "clear and reasonable" warning before knowingly and intentionally exposing anyone to a listed chemical. This warning can be given by a variety of means, such as by labeling a consumer product, posting signs at the workplace, distributing notices at a rental housing complex, or publishing notices in a newspaper. Once a chemical is listed, businesses have 12 months to comply with warning requirements.

Proposition 65 also prohibits companies that do business within California from knowingly discharging listed chemicals into sources of drinking water. Once a chemical is listed, businesses have 20 months to comply with the discharge prohibition.

Businesses with less than 10 employees and government agencies are exempt from Proposition 65's warning requirements and prohibition on discharges into drinking water sources. Businesses are also exempt from the warning requirement and discharge prohibition if the exposures they cause are so low as to create no significant risk of cancer or birth defects or other reproductive harm. Health risks are explained in more detail below.

What does a warning mean?

If a warning is placed on a product label or posted or distributed at the workplace, a business, or in rental housing, the business issuing the warning is aware or believes that one or more listed chemicals is present. By law, a warning must be given for listed chemicals unless exposure is low enough to pose no significant risk of cancer or is significantly below levels observed to cause birth defects or other reproductive harm.

For chemicals that are listed as causing cancer, the "no significant risk level" is defined as the level of exposure that would result in not more than one excess case of cancer in 100,000 individuals exposed to the chemical over a 70-year lifetime. In other words, a person exposed to the chemical at the "no significant risk level" for 70 years would not have more than a "one in 100,000" chance of developing cancer as a result of that exposure.

For chemicals that are listed as causing birth defects or reproductive harm, the "no observable effect level" is determined by identifying the level of exposure that has been shown to not pose any harm to humans or laboratory animals.

Proposition 65 then requires this “no observable effect level” to be divided by 1,000 in order to provide an ample margin of safety. Businesses subject to Proposition 65 are required to provide a warning if they cause exposures to chemicals listed as causing birth defects or reproductive harm that exceed 1/1000th of the “no observable effect level.”

To further assist businesses, OEHHA develops numerical guidance levels, known as “safe harbor numbers” (described below) for determining whether a warning is necessary or whether discharges of a chemical into drinking water sources are prohibited. However, a business may choose to provide a warning simply based on its knowledge, or assumption, about the presence of a listed chemical without attempting to evaluate the levels of exposure. Because businesses do not file reports with OEHHA regarding what warnings they have issued and why, OEHHA is not able to provide further information about any particular warning. The business issuing the warning should be contacted for specific information, such as what chemicals are present, and at what levels, as well as how exposure to them may occur.

What are safe harbor numbers?

As stated above, to guide businesses in determining whether a warning is necessary or whether discharges of a chemical into drinking water sources are prohibited, OEHHA has developed safe harbor levels. A business has “safe harbor” from Proposition 65 warning requirements or discharge prohibitions if exposure to a chemical occurs at or below these levels. These safe harbor levels consist of No Significant Risk Levels for chemicals listed as causing cancer and Maximum Allowable Dose Levels for chemicals listed as causing birth defects or other reproductive harm. OEHHA has established over 300 safe harbor levels to date and continues to develop more levels for listed chemicals.

What if there is no safe harbor level?

If there is no safe harbor level for a chemical, businesses that expose individuals to that chemical would be required to provide a Proposition 65 warning, unless the business can show that the anticipated exposure level will not pose a significant risk of cancer or reproductive harm. OEHHA has adopted regulations that provide guidance for calculating a level in the absence of a safe harbor level. Regulations are available at [Article 7](#) and [Article 8](#) of Title 27, California Code of Regulations. Determining anticipated levels of exposure to listed chemicals can be very complex. Although a business has the burden of proving a warning is not required, a business is discouraged from providing a warning that is not necessary and instead should consider consulting a qualified professional if it believes an exposure to a listed chemical may not require a Proposition 65 warning..

Who enforces Proposition 65?

The [California Attorney General's Office](#) (link is external) enforces Proposition 65. Any district attorney or city attorney (for cities whose population exceeds 750,000) may also enforce Proposition 65. In addition, any individual acting in the public interest may enforce Proposition 65 by filing a lawsuit against a business alleged to be in violation of this law. Lawsuits have been filed by the Attorney General's Office, district attorneys, consumer advocacy groups, and private citizens and law firms. Penalties for violating Proposition 65 by failing to provide notices can be as high as \$2,500 per violation per day.

How is Proposition 65 meeting its goal of reducing exposure to hazardous chemicals in California?

Since it was passed in 1986, Proposition 65 has provided Californians with information they can use to reduce their exposures to listed chemicals that may not have been adequately controlled under other State or federal laws. This law has also increased public awareness about the adverse effects of exposures to listed chemicals. For example, Proposition 65 has resulted in greater awareness of the dangers of alcoholic beverage consumption during pregnancy. Alcohol consumption warnings are perhaps the most visible health warnings issued as a result of Proposition 65.

Proposition 65's warning requirement has provided an incentive for manufacturers to remove listed chemicals from their products. For example, trichloroethylene, which causes cancer, is no longer used in most correction fluids; reformulated paint strippers do not contain the carcinogen methylene chloride; and toluene, which causes birth defects or other reproductive harm, has been removed from many nail care products. In addition, a Proposition 65 enforcement action prompted manufacturers to decrease the lead content in ceramic tableware and wineries to eliminate the use of lead-containing foil caps on wine bottles.

Proposition 65 has also succeeded in spurring significant reductions in California of air emissions of listed chemicals, such as ethylene oxide, hexavalent chromium, and chloroform.

Although Proposition 65 has benefited Californians, it has come at a cost for companies doing business in the state. They have incurred expenses to test products, develop alternatives to listed chemicals, reduce discharges, provide warnings, and otherwise comply with this law. Recognizing that compliance with Proposition 65 comes at a price, OEHHA is working to make the law's regulatory requirements as clear as possible and ensure that chemicals are listed in accordance with

rigorous science in an open public process.

Where can I get more information on Proposition 65?

For general information on the Proposition 65 list of chemicals, you may contact OEHHA's Proposition 65 program at (916) 445-6900, or visit the [Proposition 65](#) page. For enforcement information, contact the California Attorney General's Office at (510) 622-2160, or visit <http://ag.ca.gov/prop65/>

In 2017, PFOA AND PFOS were added to Prop 65.

Because manufacturers are not required to put 'warning labels' in our PPE, as per FEMSA's lobbying efforts, the end user, the firefighter, was not afforded the right in California, or any other state., of knowing that PFOA even in 'trace amounts' was an unintended by-product of production.

<https://oehha.ca.gov/proposition-65/chemicals/perfluorooctanoic-acid-pfoa-and-its-salts>

PFAS chemicals contain precursors that will form PFOA. Some in one year. PFOA is a reproductive cancer. We are wearing these chemicals in our PPE and possibly station wear, for long periods of time without knowledge of the chemicals therein.

Manufacturers will not disclose the amounts as this is proprietary information.

The current 'short-chain' technology that has replaced PFOA / C8, is not without concern. Again, we have no idea which of these chemicals and precursors are used as coatings in/on our gear. This new technology is called 'GenX'. It consists of C6 and assorted PFAS / precursors. Please review the attached link for the 2016 Evaluation of Substances Used in the GenX Technology by Chemours :

<https://www.rivm.nl/dsresource?objectid=3186e480-7d66-4ded-ac59-acd2e804d3b5&type=org&disposition=inline>

FEMSA

Due to the FEMSA (Fire and Emergency Manufacturers Services Association) 'Liability Bill', a bill that allows manufacturers the right to NOT put warning labels in PPE, the manufacturers are under no obligation to warn us:

https://www.femsa.org/whois_femsa/history/

As well, in a 1996 NFPA setting:

In 1996, during the ROP for NFPA 1971, the discussion of warning requirements and labels was a topic as well . I won't copy the entire pages, but it in hindsight if we had those warning labels, they may have had to disclose PFOA back in 2005. Still a grave missed opportunity for the end user. The firefighter.

The warning requirements were discussed to the benefit of the manufacturer. Not the firefighter. This is why this New Project Initiative includes a requirement that manufactures must warn NFPA and IAFF of any SVHC and/or CEC.

Page 3:

<https://www.nfpa.org/Assets/files/AboutTheCodes/1971/1971-F1996-ROC.pdf>

Manufactures who knew of PFOA but said nothing:

The fire-service must take measures to protect the end user, the firefighter and first responder, from omissions from manufacturers regarding potential harmful toxins in our gear.

Examples: In 1992, DuPont advised Shareholders in this alarming 38 page disclosure of the 'Growing Financial Challenges of PFOA'. Yet, not once did DuPont advise NFPA of any concerns over the chemical that was impregnated into the outer shell of turnout gear. In sharp contrast, DuPont does express much concern over the toxins in Products of Combustion while remaining mute on the amounts of PFOA directly impregnated, or, appearing as an unintended by-product of production.

Link: https://www.healthandenvironment.org/uploads-old/DuPont_Shareholders_Know_More.pdf

In particular, on page 29, DuPont's own scientists were aware PFOA CAUSES TESTICULAR CANCER AND MAMMARY TUMORS. SEE BLUE HIGHLIGHTED PARAGRAPHS BELOW FROM THIS DOCUMENT.

With manufactures so invested in firefighter cancer research, cancer symposiums, and firefighter cancer research, we can no longer afford to be lulled into a sense of protection that they alone would disclose if there was anything in our gear/wear that may be harmful to the end user. Surely DuPont knew of testicular cancer prevalence in the fire service.

We cannot mitigate against a cancer threat if we do not know it is there.

In addition to the 1992 DuPont shareholders memo, in 2005, the United Steelworkers Union sent a letter to manufacturer's who used products made with PFOA and precursors as they had grave concerns of their workers who witnessed issues pertaining to the products and their health concerns regarding products using PFOA manufactured at the Fayetteville, NC plant. This USW letter advised the recipients of the letter they had a 'duty to warn' of the health issues related to PFOA.

W.L. Gore was a recipient. I have not been able to find a safety warning to IAFF or anywhere from W.L. Gore regarding their duty to warn the end user of PFOA treated garments.

See SEC link here:

<https://www.sec.gov/Archives/edgar/data/30554/000135740607000016/dsfvreport1.txt>

POTENTIAL CONSUMER LIABILITY: CLASS ACTION AND "DUTY TO WARN" NOTICES

Companies receiving notices of a potential legal duty to warn consumers of PFOA exposure included Rug Doctor, Stanley Steemer, Conagra Foods, McDonalds, Taco Bell, Levi Strauss, GAP, W.L. Gore, Wal-Mart, Sears, Mannington, Mohawk Industries, and Shaw Industries.

Retailers and manufacturer purchasers of PFOA-containing products are being made aware of potential liabilities associated with sales of those products. Consumer protection laws in many states, including statutory and common law, provide that sellers of products may have a duty to warn consumers if they are exposing them to products that pose an unreasonable risk to health or safety.

In addition, consumer-related liability notices have been spread throughout the array of consumer-oriented markets where PFOA-related products are sold. On August 9, 2005, the United Steelworkers (USW) union released a statement saying they had sent letters to major carpet cleaning retailers and wholesalers, fast food chains, and major retail clothing companies, informing them that they may have "a legal duty to warn" their customers about potential health risks associated with exposure to products that contain PFOA. These letters informed recipients that they could face legal liability in the event that consumers sue and prove harm to their health./38/

On December 21, 2005, the United Steelworkers released another statement, reporting that they had mailed advisory information on potential PFOA-related health hazards to over 4,500 retail carpet dealers and to the CEOs of 35 carpet manufacturing companies. "We sincerely hope that our efforts will encourage carpet manufacturers and retailers to provide warnings and thereby protect the public," said Ken Test, Chair of the USW DuPont Council, a coordinating body for 1,800 USW members at DuPont. "Carpet company employees who may have the highest exposure to PFOA must also be warned and protected."/39/ USW reports that it has sent about 40,000 "duty to warn" letters to various firms that may be buying PFOA-containing products.
<PAGE>

The companies who have received duty to warn notices from USW read like a Who's Who of household consumer products. According to USW press releases, some of the thousands of companies receiving the notices included Rug Doctor, Stanley Steemer, McDonalds, Taco Bell, Papa John's, Pizza Hut, KFC, California Pizza Kitchen, Levi Strauss, Conagra Foods, GAP, W.L. Gore, Eddie Bauer, J. Crew, Wal-Mart, Sears, Nordstrom, Dillard's, Dalton

Please also reference the PFOA/POFS Timeline compiled by the Fluoride Action Network as indication of the many events relative to manufacturer DuPont surrounding PFOA. The health concerns in this timeline spans from 1960-2004.

<http://www.fluoridealert.org/wp-content/pesticides/effect.pfos.class.timeline.htm>

DuPont tested for and found PFOA in the blood of female plant workers in the Washington Works facility. The company followed and documented pregnancy outcomes in exposed workers. Two of seven children born to female plant workers between 1979 and 1981 had birth defects, one an “unconfirmed” eye and tear duct defect, and one a nostril and eye defect. In 1981 fifty women were reassigned in the plant.

In addition to causing testicular tumors, PFOA causes many other effects on the male reproductive system, including increased size of the testes, epididymides and seminal vesicles[2], and decreased prostate in rats [2, 6]. In the female, PFOA causes mammary tumors and cellular effects on the ovary [13].

Beginning in 1992, DuPont scientists began to publish papers addressing how PFOA causes testicular tumors and other harmful effects on the male reproductive tract (they have not studied mammary gland and ovarian effects). First, they found that PFOA increases blood levels of estradiol (the major form of estrogen in humans and rodents) in male rats. They also found that PFOA affects testosterone regulation, tending to decrease blood levels of testosterone and alter the production of testosterone in testicular cells[5], effects that are likely due to a “lesion at the level of the testes” [10].

A follow-up study published by DuPont scientists in 1995 showed that PFOA increases levels of estrogen by increasing activity of liver aromatase, an enzyme that converts testosterone to estradiol [5]. Biegel et al also found that PFOA increased testicular levels of a protein produced in high levels by cancer cells called transforming growth factor-alpha (TGFa) [5]. While DuPont scientists have not studied female rats as often as male rats, other studies have shown that estradiol stimulates excess release of TGF-a in mammary cells.

Because high levels of estrogen are a risk factor for the type of testicular tumor caused by PFOA, EPA suggested that the induction of Leydig cell tumors, a type of testicular tumor, by PFOA may be endocrine mediated, possibly by sustained elevation of estrogen [6].

Increased estradiol and decreased testosterone have been found in highly exposed 3M workers at a plant that produced PFOA in Cottage Grove, MN. [10, 11]. Three studies in two 3M plants have confirmed that exposed workers appear more likely to die or seek treatment for cancers of the male reproductive tract [14-16].

Footnotes to Appendix

- | | |
|---|--|
| c | <p>Identify intended users of the new project/document:</p> <p>First responders, Career, Volunteer, Wildland, Military firefighters, fire personnel working in a station from privates to chiefs, emergency responders and paramedics.</p> |
| d | <p>Identify individuals, groups and organizations that should review and provide input on the need for the proposed new project/document; and provide contact information for these groups:</p> <p>Environmental Attorney Robert Bilott,
September 5, 2017, Attorney Bilott notified the CDC/ATSDR, as well as EPA and US Attorney General via a 196 page letter relative to the concerns he has for the fire service. He is a civilian demanding studies and testing for first responders who have been exposed to PFAS's via AFFF and PPE for the fire service.</p> |

Attorney Bilott has offered his services, with his decade long affiliations with Dr Paul Brooks, among other esteemed researchers regarding the PFAS taxological data.

<https://www.documentcloud.org/documents/3988104-Firefighter-Letter.html>

IAFF

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**Deputy Directory Occupational Health and Safety; Larry Petrick
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	Manufactures of personal protection ensembles as well as manufacturers of station wear.
c	<p>Identify individuals, groups and organizations that will be or could be affected, either directly or indirectly, by the proposed new project/document, and what benefit they will receive by having this new document available:</p> <p>The end user. The firefighter, emt, paramedic. They will know what chemicals they are donning for the first time in the history of the fire service (prior to exposure to any products of combustion). With regulated amounts we will have a better understanding of cumulative exposure and with relation to toxic chemicals in our PPE will lead to minimizing exposure to carcinogens and ultimately cancer.</p> <p>Manufacturers – will be accountable for disclosing chemicals used and this will help to restore trust from members of the fire service.</p>
f	<p>Identify other related documents and projects on the subject both within NFPA and external to NFPA:</p> <p>Dr Roger Klein, delivers his thoughts on the PFOA/PFAS issue relative to PPE in this piece that was reported at the 2015 European PPE Symposium: His work begins on page 43.</p> <p>https://community.nfpa.org/external-link.jspa?url=http%3A%2F%2Fm.hemmingfire.com%2Fnews%2Fget_file.php3%2Fid%2F306%2Ffile%2Fburlington%2Bpresentations%2Bfor%2Bweb%2Brev1.pdf</p> <p>Dr Philippe Grandjean, and his discussion on Fluorocarbons” :</p> <p>http://www.nikwax.com/en-us/aboutus/persistentfluorocarbondanger.php</p> <p>excerpt: Are C6 PFC based fluorocarbon water-repellents proven to be entirely safe? No. C6 based fluorotelomers will degrade and biodegrade to PFC acids in the same way as C8 fluorotelomers. Although the ultimate biodegradation product, PFHxA, may be less dangerous to humans and the environment than PFOA, it is still potentially dangerous. Furthermore, PFHxA is only one of a group of chemicals which will result from the biodegradation of C6 fluorotelomers. As well as PFHxA, fluorotelomer acids – bigger chunks of broken up fluoropolymers – will be produced in the biodegradation process. Fluorotelomer acids have been shown to be at least as toxic to aquatic life as smaller PFC acids.</p> <p>Washington State Council of Fire Fighters along with Toxic Free Future drafted and diligently worked to pass through the legislature, Senate Bill 6413 pertaining to the use of PFAS chemicals in firefighter AFFF and PPE. This bill is the first in the nation, as this bill also pertains to AFFF, I will only copy the bill as it pertains to PPE. Please see link below for SB 6413 in its entirety.</p> <p>http://lawfilesexternal.wa.gov/biennium/2017-18/Pdf/Bills/Senate%20Passed%20Legislature/6413-S.PL.pdf</p> <p>AN ACT Relating to reducing the use of certain toxic chemicals in 2 firefighting activities; adding a new chapter to Title 70 RCW; and prescribing penalties.</p>

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF WASHINGTON:

NEW SECTION. Sec. 1. The definitions in this section apply throughout this chapter unless the context clearly requires otherwise.

(1) "Class B firefighting foam" means foams designed for flammable liquid fires.

(2) "Department" means the department of ecology.

(3) "Firefighting personal protective equipment" means any clothing designed, intended, or marketed to be worn by firefighting personnel in the performance of their duties, designed with the intent for the use in fire and rescue activities, including jackets, pants, shoes, gloves, helmets, and respiratory equipment.

(4) "Local governments" includes any county, city, town, fire district, regional fire protection authority, or other special purpose district that provides firefighting services.

(5) "Manufacturer" includes any person, firm, association, partnership, corporation, organization, joint venture, importer, or domestic distributor of firefighting agents or firefighting equipment. For the purposes of this subsection, "importer" means the owner of the product.

(6) "Perfluoroalkyl and polyfluoroalkyl substances" or "PFAS 4 chemicals" means, for the purposes of firefighting agents and firefighting equipment, a class of fluorinated organic chemicals containing at least one fully fluorinated carbon atom.

NEW SECTION. Sec. 4.

(1) Beginning July 1, 2018, a manufacturer or other person that sells firefighting personal protective equipment to any person, local government, or state agency must provide written notice to the purchaser at the time of sale if the firefighting personal protective equipment contains PFAS chemicals. The written notice must include a statement that the firefighting personal protective equipment contains PFAS chemicals and the reason PFAS chemicals are added to the equipment.

(2) The manufacturer or person selling firefighting personal protective equipment and the purchaser of the equipment must retain the notice on file for at least three years from the date of the transaction. Upon the request of the department, a person, manufacturer, or purchaser must furnish the notice, or written copies, and associated sales documentation to the department within sixty days.

NEW SECTION. Sec. 6.

(1) The department may request a certificate of compliance from a manufacturer of class B firefighting foam or firefighting personal protective equipment. A certificate of compliance attests that a manufacturer's product or products meets the requirements of this chapter.

(2) Beginning July 1, 2018, the department shall assist the department of enterprise services, other state agencies, fire protection districts, and other local governments to avoid purchasing or using class B firefighting foams to which PFAS chemicals have been intentionally added. The department shall assist the department of enterprise services, other state agencies, fire protection districts, and other local governments to give priority and preference to the purchase of firefighting personal protective equipment that does not contain PFAS chemicals.

In addition, in February 2018, NFPA published the following report:

<https://www.nfpa.org/-/media/Files/News-and-Research/Resources/Research-Foundation/Research-Foundation-reports/For-emergency-responders/RFContamControl.pdf>

Recommendations for Developing and Implementing a Fire Service Contamination Control Campaign

FOREWORD There has been growing concern among the fire and life safety community that repeated exposures to harmful contamination is likely causing increased rates of cancer in fire fighters. This includes at the fire scene and the subsequent post fire scene exposures to contaminated clothing, tools, apparatus, and stations. A strong need exists to determine the broad contamination hazards that exist throughout the fire service, and gaps in how contamination is addressed similarly need to be identified. Contamination has broader negative effects on health than just cancer. A number of other chronic health disorders could be related to broad, continuing chemical and biological exposures. This problem has not been resolved and needs to be further addressed. This report clarifies the strategy and recommendations to address the fire service contamination issue and support the development of tools to adequately address contamination control in fire service. This starts with controlling exposure and the spread of harmful fire ground contaminants, and extends beyond to all aspects of a fire fighters work life. The ultimate goal is to improve the long-term health of today's fire service. In support of this project, a two day workshop was held on 19-20 July 2017 in Columbus Ohio to address this topic. The results of that specific effort are available in separate Workshop Proceedings. The Workshop discussion and related information are partially reflected within this final project report.

Page 7:

Table 1 – Short Outline for Fire Service Contamination Control Awareness Document

Purpose: raise awareness of fire service on contamination issues

Overall length: 10 to 12 pages Key messages:

- Broad contamination hazards exist throughout the fire service (more than just cancer concern)
- Gaps in addressing contamination: not all missions, locations, and equipment are being addressed
- Comprehensive approaches are needed to limit exposure to contamination and limit transfer Content
- The contamination problem in the fire service
- Examples of contamination and how firefighters are being exposed
- Development of contamination control program and application of best practices
 - Recognition of contamination sources
 - Protective measures
 - Isolation of contaminated items
 - Post exposure cleaning and decontamination
 - Maintenance of hygiene for firefighters, apparatus, stations

- State of research in contamination control
- Current gaps in controlling contamination
- Available resources
- Reference

PAGE 9 :

Table 2 – Example for Simplifying Abstract from Academic Article

Full Published Abstract	Simplified Abstract
<p>There is a high incidence of cardiovascular disease and certain cancers in firefighters that may be related to their occupational exposure to hazardous substances. Exposure may result from contaminated personal protective gear, as well as from direct exposure at fire scenes. This study characterized flame-retardant contamination on firefighter personal protective clothing to assess exposure of firefighters to these chemicals. Samples from used and unused firefighter protective clothing, including gloves, hoods and a coat wristlet, were extracted with methylene chloride and analyzed by EPA method 8270D Specific Ion Method (SIM) for polybrominated diphenyl ethers (PBDEs). Until recently PBDEs were some of the most common flame-retardant chemicals used in the US. Fifteen of the seventeen PBDEs for which analysis was performed were found on at least one clothing swatch. Every clothing sample, including an unused hood and all three layers of an unused glove, held a detectable concentration of at least one PBDE. These findings, along with previous research, suggest that firefighters are exposed to PBDE flame retardants at levels much higher than the general public. PBDEs are found widely dispersed in the environment and still persist in existing domestic materials such as clothing and furnishings. Firefighter exposure to flame retardants therefore merits further study.</p> <p>{203 words}</p>	<p>The finding of polybrominated diphenyl ethers (PBDEs) on all samples from used and unused firefighter protective clothing that had been extracted with methylene chloride and analyzed by EPA method 8270D Specific Ion Method (SIM) suggests that firefighters' exposure to PBDE flame retardants is much higher than the general public and warrants further study.</p> <p>{53 words}</p>

exposure of firefighters to these chemicals. *Samples from used and unused firefighter protective clothing, including gloves, hoods and a coat wristlet, were extracted with methylene chloride and analyzed by EPA method 8270D Specific Ion Method (SIM) for polybrominated diphenyl ethers (PBDEs). Until recently PBDEs were some of the most common flame-retardant chemicals used in the US. Fifteen of the seventeen PBDEs for which analysis was performed were found on at least one clothing swatch. Every clothing sample, including an unused hood and all three layers of an unused glove, held a detectable concentration of at least one PBDE. These findings, along with previous research, suggest that firefighters are exposed to PBDE flame retardants at levels much higher than the general public. PBDEs are found widely dispersed in the environment and still persist in existing domestic materials such as clothing and furnishings. Firefighter exposure to flame retardants therefore merits further study*

The information published in the report states samples were from used and unused articles.

. Every clothing sample, including an unused hood and all three layers of an unused glove, held a detectable concentration of at least one PBDE. These findings, along with previous research, suggest that firefighters are exposed to PBDE flame retardants at levels much higher than the general public.

The above statement is a turning point in this issue as it would appear this is the first confirmation of concern for the actual ‘chemical additives’ used in our PPE. This is the reason we need a new initiative on the chemical additives in our PPE and station wear.

We can no longer afford to assume we start at ‘zero’ exposure. We know we do not.

We must take action to protect the protector.

g
.
Identify the technical expertise and interest necessary to develop the project/document, and if the committee membership currently contains this expertise and interest:

Professor Graham Peaslee has verified that PFOA was a component, in excessive amounts, in gear we wore in 2004.

ECHA has done the background work and substantiated their opinions.

Dr Roger Klein has produced his 40 page power point on this issue.

While this request for New Subject is on ALL chemicals added into our PPE as WR, FR, OR, IR., the research and links I am providing are relative to PFAS as that was the impetus of this project beginning two years ago.

Commander Kenny Fent, Jeff Burgess, Myrto Petreas, Alberto Caban-Martinez are all well known within the fire service for their many reports and studies on fire fighter PPE, fire fighter exposures and fire fighter cancer.

h.	<p>Provide an estimate on the amount of time needed to develop the new project/document</p> <p>This issue is IDLH. PFOA and some precursors are PBT. NFPA must act to ‘fast track’ this project. We have no knowledge of the chemicals and amounts we are wearing. We have no save handling methods for our new PPE and station wear. Without knowing chemicals and amounts we may be exposing ourselves unnecessarily to more carcinogens or potential carcinogens.</p>
i.	<p>Comment on the availability of data and other information that exists or would be needed to substantiate the technical requirements and other provisions of the proposed new project/ document:</p> <p>All manufacturers have MSDS on their material.</p> <p>The manufacturers have the information. They must disclose.</p> <p>The fire service now has a serious ‘lost-of-trust’ issue with the manufactures. Full disclosure and willingness to participate in this initiative will go a long way in restoring that trust.</p>

Please send your request to:

NFPA

Codes and Standards Administration

1 Batterymarch Park

Quincy, MA 02169

Stds_admin@nfpa.org

Rev. 6/16

Signature: _____

Name: Diane Cotter

Email:

Personal Email / Ex. 6

Affiliation: Advocate for FF toxic exposures from FF equipment.